Third United Nations International Conference on the Peaceful Uses of Atomic Energy

A/CONF.28/A/840
UNITED ARAB REPUBLIC
February 1964
Original: ENGLISH

Confidential until official release during Conference

Abstract

INVESTIGATIONS ON SITE SELECTION FOR THE FIRST U.A.R. NUCLEAR POWER STATION

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This report illustrates the main problems involved in the selection of a suitable site for the First U.A.R. Nuclear Power Station and outlines the principal investigations which were carried out for the comparative evaluation of the various sites. The anticipated power of the station is 100 to 200 MWe and it will be integrated into the general electric 220 kV network.

The main problems for siting of this station arise from the facts that: (a) being the first project of its kind in the U.A.R., safety aspects had to be particularly emphasized; and that (b) the reactor type, being not yet defined, the selected site should satisfy the main requirements for various types of power reactors.

Studies for site evaluation have been undertaken by the U.A.R. Siting Committee over the last two years and the results of these studies have been presented for consultation to an IAEA Experts' Panel convened in Cairo in May 1963. Furthermore the Consulting Engineers Kennedy and Donkin, who have been appointed as consultants for this Nuclear Power Project, have carried out further studies on site selection since May 1963.

The site investigations included initially a preliminary general survey which led to the exclusion of certain regions due to obvious economic or safety reasons. These are Southern Egypt because of the cheap hydroelectric power from the High Dam Project, the Suez Canal area for safeguard of navigation, the big cities for the high population density and the Delta Region for safeguard of agriculture and population.

The site studies have therefore been concentrated on five areas, namely:

a) Inshas on the Ismailia Canal, about 40 kms N.E. of Cairo;

b) Burg El-Arab on the Mediterranean Coast, about 30 kms W. of Alexandria;

c) Wady Hof on the Nile River, about 20 kms S. of Cairo;

d) Fayoum on Lake Quarcon, about 80 kms S.W. of Cairo; and

e) El-Tahrir on one of the canals, near to and branching from the Rosetta Branch of the Nile River, about 60 kms N.W. of Cairo.

Detailed analysis and evaluation of these areas have been carried out from the viewpoint of the following aspects:

1 - Electrical requirements including electrical loads, distance from High Dam electric power, cost of connection to the 220 kV grid and cost supply of electric power during construction;

2 - Radiation safety requirements, including population density, meteorology, hydrology, fixation properties of soil and seismic phenomena; and

3 - Constructional and operational requirements including water availability, transportation facilities, civil construction considerations and availability of qualified and skilled personnel.

The various factors included in the above-mentioned aspects have been the subject of detailed technical reports presented by qualified experts representing specialized institutes in the country. The data included in these technical reports have been taken as the basis for the comparative evaluation of the different sites. In the light of these evaluations, three areas have been considered suitable for construction of a nuclear power station, namely: Burg El-Arab, Inshas and Fayoum. Certain differences exist however between them from safety and economic aspects. At the time of writing of this abstract, the final selection of the site of the First U.A.R. Nuclear Power Station is under consideration, taking into account the balance of the relative merits and drawbacks of the proposed three sites.